
BX-7

1
00:00:00,149 --> 00:00:05,520
NASA at the Kennedy Space Center in Florida
is preparing to launch a Cygnus spacecraft

2
00:00:05,520 --> 00:00:11,610
to the International Space Station, to resupply
and sustain life for crews aboard the decades-old

3
00:00:11,610 --> 00:00:13,629
orbiting outpost.

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00:00:13,629 --> 00:00:18,529
The space station continues to serve as the
world’s leading in-space laboratory where

5
00:00:18,529 --> 00:00:24,380
astronauts perform cutting-edge science and
technology research to enable human and robotic

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00:00:24,380 --> 00:00:28,269
exploration of destinations beyond low-Earth
orbit.

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00:00:28,269 --> 00:00:34,070
The upcoming launch of Orbital ATK's Cygnus
spacecraft will be the company's seventh mission

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00:00:34,070 --> 00:00:38,200
under NASA’s Commercial Resupply Services
Contract.

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00:00:38,200 --> 00:00:44,070
Cygnus will carry 7,600 pounds of hardware
and supplies, including critical materials

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00:00:44,070 --> 00:00:49,900
for dozens of the more than 250 science and
research investigations to support the work

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00:00:49,900 --> 00:00:55,000
of crews on the space
station.

12
00:00:55,010 --> 00:00:59,740
The increased cargo is made possible because
of the recently enhanced Cygnus spacecraft.

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00:00:59,740 --> 00:01:03,690
"It has a larger cargo module than the original
standard version.

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00:01:03,690 --> 00:01:05,570
We've also upgraded the avionics.

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00:01:05,570 --> 00:01:11,030
We've also found ways to pack cargo more efficiently,
thereby allowing us to actually launch more

16
00:01:11,030 --> 00:01:14,390
cargo and taking advantage of the higher lift
capability."

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00:01:14,390 --> 00:01:19,710
Continuing its tradition, Orbital ATK dedicated
the Cygnus spacecraft to the late Project

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00:01:19,710 --> 00:01:23,130
Mercury and space shuttle astronaut John Glenn.

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00:01:23,130 --> 00:01:25,900
"The Cygnus behind me is the S.S. John Glenn.

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00:01:25,900 --> 00:01:27,790
And to us that's extremely special.

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00:01:27,790 --> 00:01:32,500
He's a hero to all of us at Orbital ATK and
so many people in the space industry."

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00:01:32,500 --> 00:01:37,520
Cygnus will lift off atop a United Launch
Alliance Atlas V rocket from Space Launch

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00:01:37,520 --> 00:01:41,830
Complex 41 at Cape Canaveral Air Force Station.

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00:01:41,830 --> 00:01:46,320
There are differences between launching to
the space station and launching a payload

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00:01:46,320 --> 00:01:49,290
to a higher altitude or a deep-space mission.

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00:01:49,290 --> 00:01:53,540
"We're going to highly-inclined, low-Earth
orbit.

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00:01:53,540 --> 00:01:57,680
Many of the missions that we fly go to geosynchronous
transfer orbits, geosynchronous altitude.

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00:01:57,680 --> 00:02:04,270
So we'll be launching out of Cape Canaveral
on a different inclination and to a much lower

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00:02:04,270 --> 00:02:07,600
altitude to support a rendezvous with the
space station."

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00:02:07,600 --> 00:02:12,499
For this mission, Cygnus will deliver several
important science and research experiments

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00:02:12,499 --> 00:02:17,349
to support investigations that will advance
our knowledge of the medical, psychological

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00:02:17,349 --> 00:02:21,790

and biomedical challenges astronauts face
during long-duration spaceflight.

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00:02:21,790 --> 00:02:26,959
"We have more than a thousand kilograms of
scientific investigations on board.

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00:02:26,959 --> 00:02:33,700
Spanning all fields of science - you name
it - physics, astronomy, biology, medical

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00:02:33,700 --> 00:02:37,400
research, as well as technology demonstrations.

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00:02:37,400 --> 00:02:42,400
And then of course the maintenance hardware
needed to keep this laboratory up and running."

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00:02:42,400 --> 00:02:47,750
Components of NASA's newest plant growth chamber,
the Advanced Plant Habitat, will be delivered

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00:02:47,750 --> 00:02:48,810
aboard Cygnus.

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00:02:48,810 --> 00:02:54,769
The habitat will integrate new technology
to increase overall efficiency, reliability

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00:02:54,769 --> 00:02:58,419
and robustness of plant growth on the space
station.

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00:02:58,419 --> 00:03:03,569
The experiment will build on the success of
NASA's Veggie, which was the first fresh food

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00:03:03,569 --> 00:03:05,419
growth system on the station.

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00:03:05,419 --> 00:03:11,969
Cygnus also will deliver a fleet of 38 CubeSats
to the space station, including 28 from different

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00:03:11,969 --> 00:03:13,709
universities around the world.

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00:03:13,709 --> 00:03:17,950
They will be launched from the NanoRacks CubeSat
Deployer on the station.

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00:03:17,950 --> 00:03:23,559
Among the tiny satellites is a science payload
known as IceCube, which will provide data

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00:03:23,559 --> 00:03:28,909
to scientists to help them understand ice
clouds and their role in climate change.

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00:03:28,909 --> 00:03:34,209
Genes in Space is an annual contest for students
in seventh to 12th grades.

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00:03:34,209 --> 00:03:39,310
Managed by the crew on the space station,
this year's winning idea for Genes in Space

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00:03:39,310 --> 00:03:45,249
II will investigate the dynamics of telomeres,
the critical protective caps on the tips of

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00:03:45,249 --> 00:03:49,019
chromosomes, as a way to understand the aging
process.

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00:03:49,019 --> 00:03:54,799
Stresses, such as those experienced by astronauts
in space, could lead to irregular regulation

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00:03:54,799 --> 00:04:01,090
of telomere length, which has been linked
to cardiovascular disease and some cancers.

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00:04:01,090 --> 00:04:06,719
Spacecraft Fire Experiment III, or Saffire
III, is the third flame investigation to use

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00:04:06,719 --> 00:04:11,640
empty Cygnus resupply vehicles after they
leave the space station and re-enter Earth's

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00:04:11,640 --> 00:04:17,019
atmosphere, providing a unique environment
for studying fires in microgravity.

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00:04:17,019 --> 00:04:23,009
The experiment will help our understanding
of how fires spread and designing flame-resistant

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00:04:23,009 --> 00:04:25,970
materials to prevent fires in space.

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00:04:25,970 --> 00:04:31,199
The Biomolecular Sequencer experiment will
demonstrate, for the first time, that DNA

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00:04:31,199 --> 00:04:34,389
sequencing is feasible in an orbiting spacecraft.

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00:04:34,389 --> 00:04:40,900
A permanent DNA sequencer could identify microbes,
diagnose diseases and monitor crew member

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00:04:40,900 --> 00:04:41,900
health.

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00:04:41,900 --> 00:04:46,820
In the future, it also could help detect DNA-based
life elsewhere in the solar system.

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00:04:46,820 --> 00:04:50,919
"The astronauts are always excited to receive
a new shipment of cargo and supplies.

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00:04:50,919 --> 00:04:56,979
Obviously, there's a lot of food specific
to certain crew members.

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00:04:56,979 --> 00:04:58,590
We all have our favorites.

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00:04:58,590 --> 00:05:05,220
And we send them up little care packages so
that they don't feel so far away from home."

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00:05:05,220 --> 00:05:10,610
Astronauts aboard the space station are performing
the hard work now that will help NASA achieve